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INSTRUCTION SHEET FOR TOOL NO. 922

ADJUSTABLE TORQUE WRENCH ADAPTER TOOL BY MOTION PRO

The Adjustable Torque Wrench Adapter is designed to be used with a torque wrench to accurately tighten fasteners that you cannot reach with a socket. This tool will work with most 6mm (1/4") through 32mm (1 1/4") combination wrenches and 6mm through 8mm Allen wrenches.

How to use the Adjustable Torque Wrench Adapter:

If you mount the wrench at a 90° angle to the handle of the torque wrench no calculations or adjustments to the specified torque value is required (see Fig. 1). This means the torque that you want to put on the fastener is equal to the reading from your torque wrench. When you mount the wrench parallel to the handle of the torque wrench, it effectively lengthens the torque wrench (see Fig. 2). Therefore, the torque value set on the torque wrench will not be equal to the torque that you apply to the fastener. Before using the Adjustable Torque Wrench Adapter, you must recalculate the torque specified in the service manual. To recalculate your torque use the torque adapter extension formula on page 2.

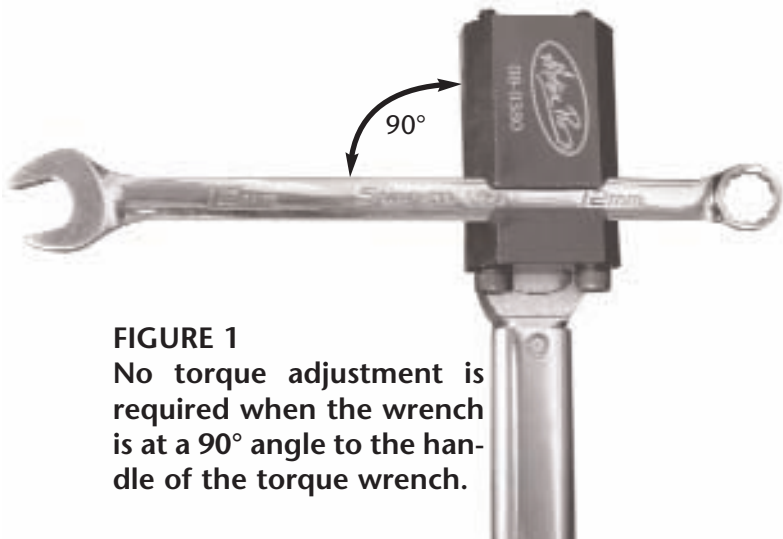
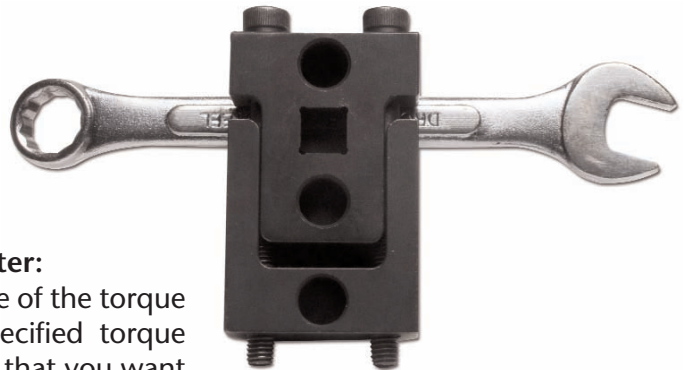


FIGURE 1
No torque adjustment is required when the wrench is at a 90° angle to the handle of the torque wrench.

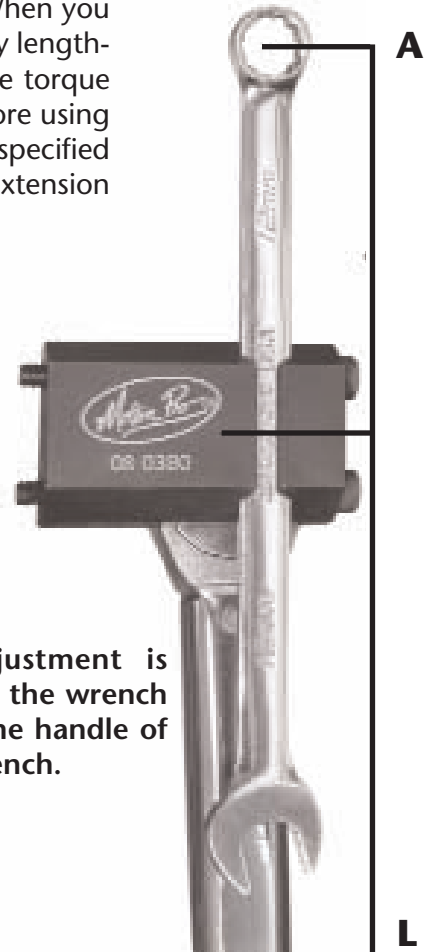


FIGURE 2
A torque adjustment is required when the wrench is parallel to the handle of the torque wrench.

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TORQUE ADAPTER EXTENSION FORMULA BY MOTION PRO

To recalculate a torque specification when using the Adjustable Torque Wrench Adapter, use the following formula:
 Corrected Torque Reading = $\frac{\text{Torque Required} \times \text{Wrench Length}}{\text{Wrench Length} + \text{Extension Length}}$

$$R = \frac{T \times L}{L + A}$$

- T** = Actual torque reading as listed in the service manual.
- L** = Torque wrench length. This is the length of your torque wrench--center of grip to center of drive (see Fig. 2 on page 1). Refer to the instructions that came with your torque wrench to determine how to measure this length.
- A** = Extension length (see Fig. 2 on page 1).
- R** = Corrected torque reading. Torque value to set on torque wrench.

NOTE: Always use the same units (in, ft, mm, cm, etc) for L and A. Do not use the torque adapter extension formula if the wrench is at an angle and not parallel to the handle of the torque wrench because distance "A" will be decreased. When the wrench is at a 90-degree angle to the handle of the torque wrench, distance "A" will be equal to zero (0) and no adjustment is required (see Fig. 1).

Example: To tighten an engine's cylinder base nuts to 20 ft.-lb. with a 3 inch extension length (combination wrench parallel to torque wrench handle), and a torque wrench with a wrench length of 12 inches, compute the extension formula as follows:

1. List all of the known formula variables:

T = 20 ft.-lb. (actual torque specification)
 L = 12 in. (torque wrench lever length)
 A = 3 in. (torque adapter extension length)

2. Plug-in each of the formula variables into the extension formula:

$$R = \frac{T \times L}{L + A} = \frac{20 \times 12}{12 + 3}$$

3. Thus, you can solve the formula as follows:

$$R = \frac{20 \times 12}{12 + 3} = \frac{240}{15} = 16 \text{ ft.-lb.}$$

Solution: In this example, your torque wrench would be set at 16 ft.-lb., but the cylinder base nuts would be tightened to 20 ft.-lb.

AFTER RECALCULATING THE TORQUE SPECIFICATION, WRITE IT DOWN HERE FOR FUTURE REFERENCE.

Model	Ft.-lb.	N-m

TO MAKE CONVERSIONS FROM ONE FORM TO ANOTHER, USE THE FOLLOWING TORQUE CONVERSION TABLE:

Multiply	By	To Obtain
foot-pounds (ft.-lb.)	1.356	Newton-meters
foot-pounds	0.1383	kilogram-meters
foot-pounds	12.0	inch-pounds
inch-pounds (in.-lb.)	0.01152	kilogram-meters
inch-pounds	0.1130	Newton-meters
inch-pounds	0.08333	foot-pounds
kilogram-meters (kg-m)	7.233	foot-pounds
kilogram-meters	86.79	inch-pounds
kilogram-meters	9.806	Newton-meters
Newton-meters (N-m)	0.7375	foot-pounds
Newton-meters	8.851	inch-pounds
Newton-meters	0.1020	kilogram-meters